a scanning subsystem [is used to read] for reading bar codes on packages entering the system so as to identify said scanned packages; and [, while]

a package dimensioning subsystem [is used to capture] for capturing information about the dimensions of each said package [prior to entry into the tunnel] as each said package is transported past said system.

6. (Amended) [An] The automated unitary-type package identification and measuring system of claim 5, wherein a Laser Detecting And Ranging (LADAR-based) scanning [methods are] method is embodied in said package dimensioning subsystem [used to capture] for capturing two-dimensional range data maps of the space above a conveyor [belt] structure along which said packages are transported, and a two-dimensional image contour tracing [methods are used] method is embodied in said package dimensioning subsystem [to extract] for extracting package dimension data [therefrom] from said two-dimensional range data maps.

7. (Amended) [A] The [unitary] automated unitary-type package identification and measuring system of claim 5, [in which the] wherein said scanning subsystem [can be] is realized using either a holographic scanning mechanism, a 1D or 2D camera system, or polygonal scanning mechanism.

8. (Amended) [A] The [unitary] automated unitary-type package identification and measuring system of claim 5, [in which] wherein the [package] velocity of each said package is computed by using a pair of amplitude modulated laser beams projected from said package dimensioning subsystem at different angular projections over [the] a conveyor [belt] structure along which said packages are transported.

9. (Amended) The [unitary] automated unitary-type package identification and measuring system of claim 8, [in which] wherein the amplitude modulated laser [scanning lasers] beams [having] have multiple wavelengths to [sensing] sense packages have a wide range of reflectivity characteristics.

Please delete claims 10-12 without prejudice or disclaimer and amend claims 13- as follows:

13. (Amended) [A] The automated unitary-type package identification and measuring system of claim 5, wherein [comprising] said [a] package dimensioning subsystem is realized as a LADAR-based package imaging detecting and dimensioning [unit (i.e.] subsystem[)] supported within said single housing above [the] a conveyor [belt] structure [of the] employed with said system.

14. (Amended) The automated package identification and measuring system of Claim 13, wherein [a] said LADAR-based imaging, detecting and dimensioning subsystem produces a synchronized

amplitude-modulated laser beam that is automatically scanned across the width of [the] said conveyor [belt] structure and, during each scan thereacross, detects and processes the reflected laser beam in order to capture a row of raw range [(and optionally reflection-intensity)] information that is referenced with respect to a polar-type coordinate system symbolically-embedded within [the] said LADAR-based imaging, detecting and dimensioning subsystem.

15. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 14, wherein the rows of range data captured by [the] said LADAR-based imaging, detecting and dimensioning subsystem are continuously loaded into a preprocessing data buffer, one row at a time, and processed in real-time using window-type convolution kernals that smooth and edge-detect the raw range data and thus improve its quality for subsequent dimension data extraction operations.

16. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 14, wherein [a] said LADAR-based imaging, detecting and dimensioning subsystem automatically subtracts detected background information (including noise) from the continuously updated range data map as to accommodate for changing environmental conditions and enable high system performance independent of background lighting conditions.

17. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 14, wherein [a] said LADAR-based imaging, detecting and dimensioning subsystem automatically buffers consecutively captured rows of smoothed/edge-detected range data to provide a range data map of the space above [the] said conveyor [belt] structure, and employs two-dimensional image contour tracing techniques to detect image contours within the buffered range data map, indicative of packages being transported [through the laser scanning tunnel system] along said conveyor structure.

18. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 17, wherein [a] said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the indices (m,n) of the computed contours in order to detect vertices associated with polygonal-shaped objects extracted from the range data map, which are representative of packages [or like objects] being transported [through the laser scanning tunnel system] along said conveyor structure.

19. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 18, wherein [the] said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of the detected vertices associated with the computed

contours in order to detect candidates for corner points associated with the corners of a particular package being transported [through the laser scanning tunnel system] along said conveyor structure.

20. (Amended) The automated unitary-type package identification and measuring subsystem of Claim 19, wherein [the] said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of detected corner point candidates in order to reduce those corner point candidates down to those most likely to be the corners of a regular-shaped polygonal object [(e.g. six sided box)].

Please delete claims 21-80 without prejudice or disclaimer.

REQUIREMENT UNDER 37 C.F.R. 1.121

As required under 37 C.F.R. 1.121, Applicants submit herewith a clean version of the first paragraph of Page 1:

RELATED CASES

This Application is a National Phase Entry Application of International Application PCT/US00/15624 filed June 7, 2000, which is a Continuation-in-Part of the following U.S. Patent Application 09/327,756 filed June 7, 1999.

Also required under 37 C.F.R. 1.121, Applicants submit the following set of claims, pursuant to the above Amendment.

5. An automated unitary-type package identification and measuring system contained within a single housing, comprising:

a scanning subsystem for reading bar codes on packages entering the system so as to identify said scanned packages; and

a package dimensioning subsystem for capturing information about the dimensions of each said package as each said package is transported past said system.

6. The automated unitary-type package identification and measuring system of claim 5, wherein a Laser Detecting And Ranging (LADAR-based) scanning method is embodied in said package dimensioning subsystem for capturing two-dimensional range data maps of the space above a conveyor structure along which said packages are transported, and a two-dimensional image contour tracing method is embodied in said package dimensioning subsystem for extracting package dimension data from said two-dimensional range data maps.

7. The automated unitary-type package identification and measuring system of claim 5, wherein said scanning subsystem is realized using either a holographic scanning mechanism, a 1D or 2D camera system, or polygonal scanning mechanism.

8. The automated unitary-type package identification and measuring system of claim 5, wherein the velocity of each said package is computed by using a pair of amplitude modulated laser beams projected from said package dimensioning subsystem at different angular projections over a conveyor structure along which said packages are transported.

9. The automated unitary-type package identification and measuring system of claim 8, wherein the amplitude modulated laser beams have multiple wavelengths to sense packages have a wide range of reflectivity characteristics.

13. The automated unitary-type package identification and measuring system of claim 5, wherein said package dimensioning subsystem is realized as a LADAR-based package imaging detecting and dimensioning supported within said single housing above a conveyor structure employed with said system.

14. The automated package identification and measuring system of Claim 13, wherein said LADAR-based imaging, detecting and dimensioning subsystem produces a synchronized amplitude-modulated laser beam that is automatically scanned across the width of said conveyor structure and, during each scan thereacross, detects and processes the reflected laser beam in order to capture a row of raw range information that is referenced with respect to a polar-type coordinate system symbolically-embedded within said LADAR-based imaging, detecting and dimensioning subsystem.

15. The automated unitary-type package identification and measuring subsystem of Claim 14, wherein the rows of range data captured by said LADAR-based imaging, detecting and dimensioning subsystem are continuously loaded into a preprocessing data buffer, one row at a time, and processed in real-time using window-type convolution kernals that smooth and edge-detect the raw range data and thus improve its quality for subsequent dimension data extraction operations.

16. The automated unitary-type package identification and measuring subsystem of Claim 14, wherein said LADAR-based imaging, detecting and dimensioning subsystem automatically subtracts detected background information (including noise) from the continuously updated range data map as to accommodate for changing environmental conditions and enable high system performance independent of background lighting conditions.

17. The automated unitary-type package identification and measuring subsystem of Claim 14, wherein said LADAR-based imaging, detecting and dimensioning subsystem automatically buffers consecutively captured rows of smoothed/edge-detected range data to provide a range data map of the space above said conveyor structure, and employs two-dimensional image contour tracing techniques to detect image contours within the buffered range data map, indicative of packages being transported along said conveyor structure.

18. The automated unitary-type package identification and measuring subsystem of Claim 17, wherein said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the indices (m,n) of the computed contours in order to detect vertices associated with polygonal-shaped objects extracted from the range data map, which are representative of packages being transported along said conveyor structure.

19. The automated unitary-type package identification and measuring subsystem of Claim 18, wherein said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of the detected vertices associated with the computed contours in order to detect candidates for corner points associated with the corners of a particular package being transported along said conveyor structure.

20. The automated unitary-type package identification and measuring subsystem of Claim 19, wherein said LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of detected corner point candidates in order to reduce those corner point candidates down to those most likely to be the corners of a regular-shaped polygonal object.